

**REMARKS**

This Amendment is filed in response to the Office Action mailed on August 7, 2007. All objections and rejections are respectfully traversed.

Claims 1-48 are currently pending.

Claims 38-48 were added to better claim the invention

Claims 1, 6-11, 13-14, 20-22, and 27-31 were amended to better claim the invention.

Claims 12 and 27 were cancelled without prejudice.

**Request for Interview**

The Applicant respectfully requests a telephonic interview with the Examiner after the Examiner has had an opportunity to consider this Amendment, but before the issuance of the next Office Action. The Applicant may be reached at 617-951-2500.

**Claim Objections**

At paragraph 4 of the Office Action, claims 22-31 were objected to. Claims 22-31 have been amended and are believed to be in condition for allowance.

**Claim Rejections – 35 USC § 102(b)**

At paragraph 6 of the Office Action, claims 11 and 15-19 were rejected over 35 U.S.C. §102(b) as being anticipated by Hitz et al., U.S. Patent No. 5,819,292, (hereinafter “Hitz”).

The present invention, as set out in representative claim 11, comprises in part:

11. A method for detecting leaked buffer writes between a first consistency point and a second consistency point, comprising:

*selecting a data buffer;*

*determining if the selected data buffer includes a buffer check control structure;*

*determining, in response to the selected data buffer including a buffer check control structure, if a consistency point number within the buffer check control structure is correct;*

*determining if one or more uniquely identifying numbers (hereinafter magic numbers) are within the data buffer check control structure; and*

*performing, in response to determining that the consistency point number and the one or more magic numbers within the buffer check control structure are correct, a write operation of a file system buffer.*

Hitz discloses identifying snapshots with a 20 bit entry into a 32 bit number (Col 9 line 50-65, Figs 11A-11D)

Applicant respectfully urges that Hitz does not disclose Applicant’s claimed novel *selecting a data buffer; determining if the selected data buffer includes a buffer check control structure; determining, in response to the selected data buffer including a buffer check control structure, if a consistency point number within the buffer check*

*control structure is correct; determining if one or more uniquely identifying numbers (hereinafter magic numbers) are within the data buffer check control structure; and performing, in response to determining that the consistency point number and the one or more magic numbers within the buffer check control structure are correct, a write operation of a file system buffer.*

Applicant's claimed invention is directed toward a method for detecting leaked buffer write operations across storage system consistency points generated by the storage system. The system determines *if the selected data buffer includes a buffer check control structure*. If the system determines that a selected data buffer includes a buffer check control structure, then the system determines whether *a consistency point number within the buffer check control structure is correct*. Then the system determines whether *one or more uniquely identifying numbers (hereinafter magic numbers) are within the data buffer check control structure* and performs *in response to determining that the consistency point number and the one or more magic numbers within the buffer check control structure are correct, a write operation of a file system buffer*. Thus, there must be both at least two unique identifiers (i.e., the magic numbers) and the consistency number located in the in the *buffer check control structure* in order to determine whether the CP value is properly associated with the write operation.

That is, a data buffer is selected... the method performs *determining, if a consistency point number within the buffer check control structure is correct...determining if one or more uniquely identifying numbers are within the data buffer check control structure and ...performing . . . a write operation of a file system buffer* in response to the both the consistency point and the uniquely identifying numbers being correct.

In contrast, there is no disclosure in Hitz which determines if one or more magic values are contained within the data buffer. Hitz discloses a method for creating read-only copies of a file system (i.e., snapshots) and at no time does Hitz determine whether or not uniquely identified magic numbers are used to identify his snapshots.

Accordingly, Applicant respectfully urges that Hitz is legally insufficient to anticipate the present claims under 35 U.S.C. §102 because of the absence of the Applicant's claimed novel *selecting a data buffer; determining if the selected data buffer includes a buffer check control structure; determining, in response to the selected data buffer including a buffer check control structure, if a consistency point number within the buffer check control structure is correct; determining if one or more uniquely identifying numbers (hereinafter magic numbers) are within the data buffer check control structure; and performing, in response to determining that the consistency point number and the one or more magic numbers within the buffer check control structure is are correct, a write operation of a file system buffer.*

**Claim Rejections – 35 USC §103**

At paragraph 7-9 of the Office Action, claims 1-10, 12-14, and 20-37 were rejected under 35 U.S.C. as being unpatentable over Hitz, in view of Marion et al., U.S. Publication No. 2003/0163661 published on August 28, 2003 (hereinafter “Marion”), and in further view of Ganesh et al. US Patent No. 6,197,377 issued on February 20, 2001 (hereinafter “Ganesh”).

The present invention, as set out in representative claim 1, comprises in part:

1. A method for detecting leaked buffer writes between a first consistency point and a second consistency point, the method comprising:

*receiving a write operation, the write operation identifying a file for the write operation;*

*determining that a volume storing the file has buffer leakage detection activated;*

*creating a data buffer associated with the write operation; and*

*in response to determining the volume has buffer leakage detection activated, writing a buffer check control structure to a raw data buffer associated with the data buffer, the buffer check control structure including one or more uniquely identifying numbers referred to as magic numbers and a consistency point number.*

Marion discloses a memory divided into memory array slots. Each slot has a flag which indicates whether the slot is allocated or de-allocated.

Ganesh discloses using a snapshot and a transaction summary to determine if a particular data block is invalid and therefore can be overwritten.

Applicant respectfully urges that neither Hitz, Marion, nor Ganesh disclose Applicant's claimed

*receiving a write operation, the write operation identifying a file for the write operation;*

*determining that a volume storing the file has buffer leakage detection activated;*

*creating a data buffer associated with the write operation; and in response to determining the volume has buffer leakage detection activated, writing a buffer check control structure to a raw data buffer associated with the data buffer, the buffer check control structure including one or more uniquely identifying numbers referred to as magic numbers and a consistency point number.*

As noted above applicants claimed invention is directed toward a method for detecting leaked buffer write operations across file system consistency points generated by the storage system. In particular the system performs *receiving a write operation, the write operation identifying a file for the write operation*. Then the system determines *that a volume storing the file has buffer leakage detection activated*. Once buffer leak-

age detection is activated the system creates *a data buffer associated with the write operation*. Then *in response to determining the volume has buffer leakage detection activated, writing a buffer check control structure to a raw data buffer associated with the data buffer, the buffer check control structure including one or more uniquely identifying numbers referred to as magic numbers and a consistency point number*.

That is the system receives a write operation... determines that a volume storing the file has buffer leakage detection activated...creates a data buffer associated with the write operation and in response writes a buffer check control structure to a raw data buffer associated with the data buffer, the buffer check control structure including one or more uniquely identifying numbers referred to as magic numbers and a consistency point number.

In contrast to Ganesh specifically, Ganesh does not disclose determining whether at least two magic numbers and one consistency number are present in the buffer control structure in order to determine whether or not there is a leak in the buffer write operations. Rather, Ganesh merely discloses using an index to locate various versions of a block to see if those versions may be **overwritten** for that particular transaction. Unlike the Applicant's claimed invention, Ganesh does not determine if a specific magic number is located within the buffer check control structure in order to determine where the pointers are correctly labeled. Neither Hitz nor Marion, disclose the uses of uniquely identify-

ing numbers (i.e., magic numbers) that may be used to detect buffer leakage in the storage system.

Also, in contrast, Marion's memory is divided into memory array slots. Each slot has a flag which indicates whether the slot is allocated or de-allocated.

Applicant respectfully urges that Marion's flag indicating whether or not his memory is allocated cannot anticipate Applicant's claimed method which performs *de-termining if a consistency point number within the buffer check control structure is correct...determining if one or more uniquely identifying numbers are within the data buffer check control structure and ...performing . . . a write operation of a file system buffer* in response to the both the consistency point and the uniquely identifying numbers being correct.

Applicant respectfully urges that Hitz, Marion or Ganesh, either taken either singly or in any combination, are legally insufficient to render the presently claimed invention obvious under 35 U.S.C 103(a) because of the absence in each of the cited patents of Applicant's claimed novel

*receiving a write operation, the write operation identifying a file for the write operation;*



*determining that a volume storing the file has buffer leakage detection activated; creating a data buffer associated with the write operation; and*

*in response to determining the volume has buffer leakage detection activated, writing a buffer check control structure to a raw data buffer associated with the data buffer, the buffer check control structure including one or more uniquely identifying numbers referred to as magic numbers and a consistency point number.*

### **CONCLUSION**

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims.

Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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